

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-24. (Canceled)

25. (New) A method for reading a radiation image from a stimulable phosphor layer comprising the steps of:

(a) applying a stimulating light with a stimulating light-applying unit onto an area of the stimulable phosphor layer, wherein the stimulable phosphor layer has inherent surface irregularities, and wherein the stimulable phosphor layer has a means for forming a reference plane to track the surface irregularities; whereby a stimulated emission emits from said light-applied area of the stimulable phosphor layer through a lens, the lens having a focal depth measured from a mean height of the stimulable phosphor layer; and wherein an intensity of the stimulated emission corresponds to a level of energy stored by phosphors in said light-applied area of the stimulable phosphor layer;

(b) receiving the stimulated emission emitting through the lens with a stimulated emission-receiving plane, wherein the stimulated emission-receiving plane is spaced at a distance from the light-applied area of the stimulable phosphor layer, and wherein the distance is predetermined so as to focus the stimulated emission emitting through the lens onto the stimulated emission-receiving plane;

(c) photoelectrically converting the stimulated emission into electrical signals;

(d) repeating (a) through (c) for every area of the stimulable phosphor layer, wherein the distance is maintained by the reference plane forming means such that the distance varies only within the focal depth; and

(e) assembling the electrical signals to form the radiation image.

26. (New) The method of claim 25, wherein the reference plane-forming means comprise a substrate on the side of the stimulable phosphor layer facing the lens; wherein the reference plane corresponds to the interface between the substrate and the stimulable phosphor layer, and wherein the stimulable phosphor layer is supported at the reference plane by the substrate on supporting means, the supporting means maintaining the distance between the phosphor layer and the stimulated emission-receiving plane.

27. (New) The method of claim 25, wherein the reference plane-forming means comprise frame members on the side of the stimulable phosphor layer facing the lens; wherein the frame members form the reference plane parallel to the surface of the stimulable phosphor layer, and wherein a stimulated emission-collecting unit is supported by the frame members, whereby the distance between the phosphor layer and the stimulated emission-receiving plane is maintained.

28. (New) The method of claim 26, wherein the substrate is a transparent substrate, and wherein the stimulated emission emits first through the transparent substrate and second through the lens.

29. (New) The method of claim 26, wherein the stimulated emission passes through the lens without passing through the substrate.

30. (New) The method of claim 25, wherein the stimulable phosphor layer is moved relative to the stimulated-emission receiving plane.

31. (New) The method of claim 25, wherein the stimulated-emission receiving plane is contained within a stimulated emission-collecting unit, and wherein the stimulated emission collecting unit is moved relative to the stimulable phosphor layer.

32. (New) The method of claim 26, wherein the substrate is a rigid substrate.

33. (New) The method of claim 32, wherein the rigid substrate is made of material having a modulus of elasticity of 1×10^5 kgf/cm² or higher, and wherein the rigid substrate has a thickness in the range of 200 µm to 10 mm.

34. (New) The method of claim 28, wherein the transparent substrate is a rigid transparent substrate.

35. (New) The method of claim 34, wherein the transparent substrate is a glass sheet.

36. (New) The method of claim 25, wherein the stimulable phosphor layer has a surface irregularity within a range of ±100 µm.

37. (New) The method of claim 25, wherein the stimulable phosphor layer has a surface irregularity within a range of $\pm 50 \mu\text{m}$.

38. (New) The method of claim 25, wherein the stimulable phosphor layer further comprises a stimulated emission-reflecting layer on a side opposite the substrate.

39. (New) The method of claim 25, wherein the stimulable phosphor layer is produced by a gas phase deposition method.

40. (New) The method of claim 25, wherein the stimulating light-applying unit and the stimulated emission-receiving plane are arranged on a side of the stimulable phosphor layer having the reference plane-forming means.

41. (New) A radiation image reading apparatus comprising:

(a) a stimulating light-applying unit, wherein said stimulating light-applying unit stimulates an area of a stimulable phosphor layer, whereby a stimulated emission emits from the light-applied area;

(b) a stimulated emission-collecting unit, said stimulated emission-collecting unit comprising a stimulated emission-receiving plane and a lens, the lens having a focal depth; wherein said stimulated emission-collecting unit receives stimulated emissions from the stimulable phosphor layer, wherein said stimulated emission-collecting unit photoelectrically converts the stimulated emissions into electrical signals, and wherein said stimulated emission-collecting unit assembles the electrical signals into a radiation image;

(c) supporting means, wherein the supporting means are arranged in a position fixed in relation to said stimulated emission-collecting unit, and wherein the supporting means allow movement of the stimulable phosphor layer along a reference plane by supporting the stimulable phosphor layer at the reference plane, such that a distance between the phosphor layer and the stimulated emission-receiving plane varies only within the focal depth, and

(d) a driving means for driving the movement of the stimulable phosphor layer.

42. (New) A radiation image reading apparatus comprising:

(a) a stimulating light-applying unit, wherein said stimulating light-applying unit stimulates an area of a stimulable phosphor layer, whereby a stimulated emission emits from the light-applied area,

(b) a stimulated emission-collecting unit, said stimulated emission-collecting unit comprising a stimulated emission-receiving plane and a lens, the lens having a focal depth; wherein said stimulated emission-collecting unit receives stimulated emissions from the stimulable phosphor layer, and wherein said stimulated emission-collecting unit photoelectrically converts the stimulated emissions into electrical signals, and wherein said stimulated emission-collecting unit assembles the electrical signals into a radiation image,

(c) supporting means, wherein the supporting means are arranged in a position fixed in relation to the stimulable phosphor layer, wherein the supporting means allow movement of said stimulated emission-collecting unit, and wherein the supporting means support the stimulable phosphor layer at a reference plane, such that a distance between the phosphor layer and the stimulated emission-receiving plane varies only within said focal depth, and

(d) a driving means for driving the movement of the stimulated emission-collecting unit.

43. (New) A radiation image reading apparatus comprising:

(a) a stimulating light-applying unit, wherein said stimulating light-applying unit stimulates an area of a stimulable phosphor layer, whereby a stimulated emission emits from the light-applied area; wherein the stimulable phosphor layer has frame members attached to a surface thereof, the frame members tracking irregularities of the stimulable phosphor layer surface;

(b) a stimulated emission-collecting unit, said stimulated emission-collecting unit receiving stimulated emissions from the stimulable phosphor layer, wherein said stimulated emission-collecting unit contacts the frame members, wherein said stimulated emission-collecting unit photoelectrically converts the stimulated emissions into electrical signals, and wherein said stimulated emission-collecting unit assembles the electrical signals into a radiation image; and

(c) a driving means for driving the movement of said stimulated emission-collecting unit relative to the stimulable phosphor layer.

44. (New) A radiation image reading apparatus comprising:

(a) a stimulating light-applying unit, wherein said stimulating light-applying unit stimulates an area of a stimulable phosphor layer, whereby a stimulated emission emits from the light-applied area; wherein the stimulable phosphor layer has frame members attached to

a surface thereof, the frame members tracking irregularities of the stimulable phosphor layer surface;

(b) a stimulated emission-collecting unit, said stimulated emission-collecting unit receiving stimulated emissions from the stimulable phosphor layer, wherein said stimulated emission-collecting unit contacts the frame members, wherein said stimulated emission-collecting unit photoelectrically converts the stimulated emissions into electrical signals, and wherein said stimulated emission-collecting unit assembles the electrical signals into a radiation image; and

(c) a driving means for driving the movement of the stimulable phosphor layer relative to said stimulated emission-collecting unit.

45. (New) A stimulable phosphor sheet comprising: a stimulable phosphor layer and frame members; wherein said stimulable phosphor layer has a surface with irregularities, wherein said frame members form a reference plane parallel to the surface of the stimulable phosphor layer, and wherein said frame members are capable of supporting a stimulated emission-collecting unit at the reference plane.

46. (New) A stimulable phosphor sheet comprising: a stimulable phosphor layer and a transparent substrate layer; wherein said stimulable phosphor layer has a surface with irregularities, wherein said transparent substrate layer forms a reference plane at an interface of said transparent substrate and said stimulable phosphor layer, wherein said transparent substrate has overhanging areas, and wherein said phosphor layer is capable of being supported at the reference plane by the overhanging areas of said transparent substrate layer.

47. (New) The stimulable phosphor sheet of claim 45 or claim 46, wherein said stimulable phosphor layer has a curved, deformed, or sloping surface.

48. (New) The stimulable phosphor sheet of claim 45 or claim 46, wherein said stimulable phosphor layer is produced by a gas phase deposition.